SEQUENCE LISTING (1)GENERAL INFORMATION: (i) APPLICANT: TZAHI ARAZI, YOEL MOSHE SHIBOLETH AND AMIT GAL-ON TITLE OF INVENTION: VECTORS FOR EXPRESSING HETEROLOGOUS PEPTIDES AT THE AMINO-TERMINUS OF POTYVIRUS COAT Protein, methods for use thereof, plantS infected with same and methods of vaccination using same NUMBER OF SEQUENCES: 33 (ili) (1V) CORRESPONDENCE ADDRESS: Mark M. Friedman C/O Mr Bill Polkinghorn (A) ADDRESSEE: Discovery Dispatch 9003 Florin Way (TT) STREET: (C) CITY: Upper Marlboro (D) STATE: Maryland (E) COUNTRY: United States of America (F) ZIP: COMPUTER READABLE FORM: (v) 1.44 megabyte, 3.5" microdisk (A) MEDIUM TYPE: (B) COMPUTER: Twinhead* Slimnote-890TX MS DOS version 6.2, (C) OPERATING SYSTEM: Windows version 3.11 Word for Windows version 2.0 converted to (D) SOFTWARE: an ASCI file CURRENT APPLICATION DATA: (A) APPLICATION NUMBER: XXX (B) FILING DATE: XXX XXX (C) CLASSIFICATION: (vii) PRIOR APPLICATION DATA: (A) APPLICATION NUMBER: 60/253,136 FILING DATE: 28 November, 2000 (B) (C) APPLICATION NUMBER: (D) FILING DATE: APPLICATION NUMBER: (V) (F) FILING DATE: (viii) ATTORNEY/AGENT INFORMATION: (A) NAME: Friedmam, Mark M. (B) REGISTRATION NUMBER: 33,883 REFERENCE/DOCKET NUMBER: 1686/4 TELECOMMUNICATION INFORMATION: (ix) TELEPHONE: 972-3-5625553 (A) (B) TELEFAX: 972-3-5625554 (C) TELEX: (2)INFORMATION FOR SEQ ID NO:1: SEQUENCE CHARACTERISTICS: (A) LENGTH: (B) nucleic acid STRANDEDNESS: double (C) TOPOLOGY: linear SEQUENCE DESCRIPTION: SEQ ID NO:1: (xi) TCAGGCACTC AGCCAACTGT GGCAGATGCT GGAGCTACAA AGAAAGATAA 50 AGAAGATGAC AAAGGGAAAA ACAAGGACGT TACAGGCTCC GGCTCAGGTG 100 AGAAAACAGT AGCAGCTGTC ACGAAGGACA AGGATGTGAA TGCTGGTTCT CATGGGAAAA TTGTGCCGCG TCTTTCGAAG ATCACAAAGA AAATGTCATT 200

GCCACGCGTG AAAGGAAATG TGATACTCGA TATTGATCAT TTGCTGGAAT 250 ATAAACCGGA TCAAATTGAG TTATATAACA CACGAGCGTC TCATCAGCAG 300 TTCGCCTCTT GGTTCAACCA GGTTAAGACG GAATATGATT TGAACGAGCA 350 ACAGATGGGA GTTGTAATGA ATGGTTTCAT GGTTTGGTGC ATTGAGAATG 400

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GCACTTCACC CGACATTAAT GGAGTGTGG TTATGATGGA CGGAAATGAG 450
CAAGTTGAGT ATCCCTTGAA ACCAATAGTT GAAAATGCAA AGCCAACGCT 500
GCGGCAAAATA ATGCATCATT TTTCAGATGC AGCGAGAGCA TATATATAGAGA 550
CTACGGGATA AGGCACCA TACATGCCGA GGTATGGTTT GCTTCGAAAAC 600
CTACGGGATA GGAGTATAGC ACCAGTATGCT TTTGATTTCT ATGAAGTCAA 650
TTCTAAAACT CCTGAAAGAG CCCGCGAAGC TGTTGCGCAG ATGAAAGCAG 700
CAGCTCTTAG CAATGTTTCT TCAAGGTTGT TTGGCCTTGA TGGAAATGTT 750
GCCACCACTA GCGAAGACAC TGAACGGCAC ACTGCACGT ATGTTAATAG 800
AAACATGCAC ACCTTACTAG GTGTGAATAC AATGCAG 837
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(2) INFORMATION FOR SEQ ID NO:2:

(a) LENGTH: 279

(B) TYPE: amino acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Ser Gly Thr Gln Pro Thr Val Ala Asp Ala Gly Ala Thr Lys Lys 10 Asp Lys Glu Asp Asp Lys Gly Lys Asn Lys Asp Val Thr Gly Ser 20 25 30 Gly Ser Gly Glu Lys Thr Val Ala Ala Val Thr Lys Asp Lys Asp 40 45 35 Val Asn Ala Gly Ser His Gly Lys Ile Val Pro Arg Leu Ser Lys 50 55 60 Ile Thr Lys Lys Met Ser Leu Pro Arg Val Lys Gly Asn Val Ile 75 65 70 Leu Asp Ile Asp His Leu Leu Glu Tyr Lys Pro Asp Gln Ile Glu 80 85 Leu Tyr Asn Thr Arg Ala Ser His Gln Gln Phe Ala Ser Trp Phe 95 100 105 Asn Gln Val Lys Thr Glu Tyr Asp Leu Asn Glu Gln Gln Met Gly 110 115 120 Val Val Met Asn Gly Phe Met Val Trp Cys Ile Glu Asn Gly Thr 125 130 135 Ser Pro Asp Ile Asn Gly Val Trp Val Met Met Asp Gly Asn Glu 140 145 150 Gln Val Glu Tyr Pro Leu Lys Pro Ile Val Glu Asn Ala Lys Pro 155 160 1.65 Thr Leu Arg Gln Ile Met His His Phe Ser Asp Ala Ala Glu Ala 170 175 180 Tyr Ile Glu Met Arg Asn Ala Glu Ala Pro Tyr Met Pro Arg Tyr 185 190 195 Gly Leu Leu Arg Asn Leu Arg Asp Arg Ser Leu Ala Arg Tyr Ala 200 205 210 Phe Asp Phe Tyr Glu Val Asn Ser Lys Thr Pro Glu Arg Ala Arg 215 220 225 Glu Ala Val Ala Gln Met Lys Ala Ala Ala Leu Ser Asn Val Ser 230 235 240 Ser Arg Leu Phe Gly Leu Asp Gly Asn Val Ala Thr Thr Ser Glu 250 245 255 Asp Thr Glu Arg His Thr Ala Arg Asp Val Asn Arg Asn Met His 260 265 Thr Leu Leu Gly Val Asn Thr Met Gln 275

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 20

(B) TYPE: nucleic acid (C) STRANDEDNESS: Single (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

CATTTCCTTT CACGCGTGGC 20

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 (B) TYPE: nu

(B) TYPE: nucleic acid(C) STRANDEDNESS: Single

(XI) TOPOLOGY: linear (XI) SEQUENCE DESCRIPTION: SEQ ID NO:4:

TCACACCATC ACCATCACCA T

(2) INFORMATION FOR SEQ ID NO:5:

(1) SEQUENCE CHARACTERISTICS: (A) LENGTH: 7

21

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(B)
                       TYPE:
                                       amino acid
                       STRANDEDNESS: single
                (C)
                (D)
                      TOPOLOGY:
                                       linear
                SEQUENCE DESCRIPTION: SEQ ID NO:5:
Ser His His His His His
        INFORMATION FOR SEQ ID NO:6:
(2)
                SEQUENCE CHARACTERISTICS:
                      LENGTH: 53
                (A)
                       TYPE:
                                       nucleic acid
                       STRANDEDNESS: Single TOPOLOGY: linear
                (C)
                     TOPOLOGY:
                (D)
                SEQUENCE DESCRIPTION: SEQ ID NO:6:
CAGCTGCAGT CACACCATCA CCATCACCAT TCAGGCACTC AGCCAACTGT 50
GGC
(2)
        INFORMATION FOR SEQ ID NO:7:
               SEQUENCE CHARACTERISTICS:
                       LENGTH:
                (A)
                       TYPE:
                                       nucleic acid
                (B)
                       STRANDEDNESS: Single TOPOLOGY: linear
                (C)
                       TOPOLOGY:
               SEQUENCE DESCRIPTION: SEQ ID NO:7:
CAGCTGCAGT CACACCATCA CCATCACCAT GATACTGGAG CTACAAAGAA 50
        INFORMATION FOR SEQ ID NO:8:
(2)
        (i)
               SEQUENCE CHARACTERISTICS:
                       LENGTH: 55
                (A)
                (B)
                       TYPE:
                                       nucleic acid
                       STRANDEDNESS: Single
TOPOLOGY: linear
                (C)
                      TOPOLOGY:
                (D)
                SEQUENCE DESCRIPTION: SEQ ID NO:8:
        (xi)
TCAGCATCAG AGCAGAAGCT CATTTCAGAG GAGGATCTCG GATCC 45
        INFORMATION FOR SEQ ID NO:9:
               SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 15
(B) TYPE: amino acid
                     STRANDEDNESS: single
TOPOLOGY: linear
                (C)
                (D)
               SEQUENCE DESCRIPTION: SEQ ID NO:9:
Ser Ala Ser Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Gly Ser
                    5
                                           10
        INFORMATION FOR SEQ ID NO:10:
(1) SEQUENCE CHARACTERISTICS:
(2)
                       LENGTH:
                (A)
                       TYPE:
                                       nucleic acid
                (B)
               (C) STRANDEDNESS: Single
(D) TOPOLOGY: linear
SEQUENCE DESCRIPTION: SEQ ID NO:10:
        (xi)
CAGCTGCAGT CAGCATCAGA GCAGAAGCTC ATTTCAGAGG AGGATCTCGG 50
ATCCTCAGGC ACTCAGCCAA CTGTGGC
(2)
        INFORMATION FOR SEQ ID NO:11:
        (i)
               SEQUENCE CHARACTERISTICS:
                     LENGTH: 82
                (A)
                (B)
                       TYPE:
                                       nucleic acid
                       STRANDEDNESS: Single
TOPOLOGY: linear
                (C)
                (D)
               SEQUENCE DESCRIPTION: SEQ ID NO:x:
CAGCTGCAGT CAGCATCAGA GCAGAAGCTC ATTTCAGAGG AGGATCTCGG 50
ATCCGATACT GGAGCTACAA AGAAAGATAA AG
(2)
        INFORMATION FOR SEQ ID NO:12:
               SEQUENCE CHARACTERISTICS:
        (i)
                (A)
                       LENGTH: 81
                (B)
                       TYPE:
                                       nucleic acid
                       STRANDEDNESS: Single
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	(xi)			linear SEQ ID NO:12:	
			GCAGAAGCTC ATGACAAAGG	ATTTCAGAGG AGGATCTCGG	50 81
(2)	INFORM	SEQUENCE (A) LE (B) TY (C) SI (D) TO		CCS: 31 nucleic acid	
CGCGGA	TCCG A	TGACAAAGG	GAAAAACAAG	G	31
(2)	INFORM (i) (xi)	SEQUENCE (A) LE (B) TY (C) ST (D) TO	RANDEDNESS:	CCS: 30 nucleic acid Single	
CTCGGA	TCCA A	CAAGGATGT	TACAGGCTCC		30
(2)	INFORM	SEQUENCE (A) LE (B) TY (C) SI	SEQ ID NO:15 CHARACTERISTI :NGTH: :PE: :PRANDEDNESS:	CCS: 27 nucleic acid Single	
	(xi)			SEQ ID NO:15:	
CGCGGA	TCCG G	CTCCGGCTC	AAGTGAG		27
(2)	INFORM	SEQUENCE (A) LE (B) TY (C) ST (D) TO	PE: RANDEDNESS: POLOGY:	CCS: 30 nucleic acid Single	
CGCGGA	•		GGCAGCTGTC		30
(2)	INFORM	ATION FOR SEQUENCE (A) LE (B) TY (C) ST (D) TC	SEQ ID NO:17 CHARACTERISTI NGTH: PE: PANDEDNESS:	CCS: 28 nucleic acid	•
CCCCCA	(xi)	SEQUENCE TGTCACGAA		SEQ ID NO:I/:	28
(2)	INFORM	ATION FOR SEQUENCE (A) LE (B) TY (C) ST (D) TO	SEQ ID NO:18 CHARACTERISTI NGTH: PE: PANDEDNESS: POLOGY:	CCS: 33 nucleic acid Single linear	20
acaca	(xi)			SEQ ID NO:18:	2.2
(2)		ATION FOR SEQUENCE ((A) LE (B) TY (C) ST (D) TO	TGCTGGTTCT SEQ ID NO:19 CHARACTERISTI NGTH: PE: RANDEDNESS: POLOGY: DESCRIPTION:	: CCS: 30 nucleic acid	33
CTCGGA	TCCG G	TTCTCATGG	GAAAATTGTG		30
(2)	INFORM	ATION FOR	SEQ ID NO:20	:	

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(i)
               SEQUENCE CHARACTERISTICS:
                      LENGTH:
                (A)
                (B)
                       TYPE:
                                      nucleic acid
                       STRANDEDNESS: Single
                (C)
                       TOPOLOGY:
                (D)
                                      linear
        (xi)
               SEQUENCE DESCRIPTION: SEQ ID NO:20:
AGTGTGAGAG GAGATCTTCA AGTGCTTGCA CGAAAAGCAG CAAGACCACT 50
        INFORMATION FOR SEQ ID NO:21:
(2)
               SEQUENCE CHARACTERISTICS:
               (A)
                      LENGTH: 17
                       TYPE:
                                      amino acid
                       STRANDEDNESS: single
               (C)
                     TOPOLOGY:
                                      linear
        (xi)
               SEQUENCE DESCRIPTION: SEQ ID NO:21:
Ser Val Arg Gly Asp Leu Gln Val Leu Ala Arg Lys Ala Ala Arg
                                          10
Pro Leu
     17
(2)
        INFORMATION FOR SEQ ID NO:22:
               SEQUENCE CHARACTERISTICS:
                      LENGTH: 87
               (A)
                       TYPE:
                                      nucleic acid
                (B)
                     STRANDEDNESS: Single
TOPOLOGY: linear
               (C)
                (D)
        (xi)
               SEQUENCE DESCRIPTION: SEQ ID NO:22:
CAGCTGCAGT CCGTGAGAGG AGATCTTCAA GTGCTTGCAC GAAAAGCAGC 50
AAGACCACTT AAGAAAGATA AAGAAGATGA CAAAGGG
       INFORMATION FOR SEQ ID NO:23:
(i) SEQUENCE CHARACTERISTICS:
(2)
                      LENGTH: 83
TYPE: nucleic acid
               (A)
               (B)
                      STRANDEDNESS: Single
TOPOLOGY: linear
               (C)
               (D)
               SEQUENCE DESCRIPTION: SEQ ID NO:23:
CAGCTGCAGA GTGTGAGAGG AGATCTTCAA GTGCTTGCAC GAAAAGCAGC 50
AAGACCACTT TCAGGCACTC AGCCAACTGT GGC
(2)
       INFORMATION FOR SEQ ID NO:24:
               SEQUENCE CHARACTERISTICS:
        (i)
               (A)
                      LENGTH: 84
               (B)
                       TYPE:
                                      nucleic acid
                      STRANDEDNESS: Single
               (C)
                     TOPOLOGY:
               (D)
                                      linear
               SEQUENCE DESCRIPTION: SEQ ID NO:24:
       (xl)
CGCGGATCCG TGAGAGGAGA TCTTCAAGTG CTTGCACGAA AAGCAGCAAG 50
ACCACTTAAG AAAGATAAAG AAGATGACAA AGGG
(2)
       INFORMATION FOR SEQ ID NO:25:
               SEQUENCE CHARACTERISTICS:
                    LENGTH: 33
               (A)
               (B)
                       TYPE:
                                      nucleic acid
                      STRANDEDNESS: Single TOPOLOGY: linear
               (C)
               (D)
               SEQUENCE DESCRIPTION: SEQ ID NO:25:
       (xi)
CAGCTGCAGT CCGAGAAAAC AGTGGCAGCT GTC
                                                                33
       INFORMATION FOR SEQ ID NO:26:
(i) SEQUENCE CHARACTERISTICS:
(2)
                      LENGTH:
                                  34
               (A)
                       TYPE:
               (B)
                                      nucleic acid
                      STRANDEDNESS: Single TOPOLOGY: linear
               (C)
               (D)
               SEQUENCE DESCRIPTION: SEO ID NO:26:
       (xi)
CAGCTGCAGT CCGACACTGG AGCCACAAAG AAAG
                                                                 34
(2)
       INFORMATION FOR SEQ ID NO:27:
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(i)
               SEQUENCE CHARACTERISTICS:
                (A)
                       LENGTH:
                       TYPE:
                                      nucleic acid
                       STRANDEDNESS: Single
                (C)
                (D)
                       TOPOLOGY:
                                      linear
        (xi)
               SEQUENCE DESCRIPTION: SEQ ID NO:27:
CAGCTGCAGT CCAAGAAGA CAAAGAAGAT GACAAAG
                                                                  37
       INFORMATION FOR SEQ ID NO:28:
(i) SEQUENCE CHARACTERISTICS:
(2)
                       LENGTH:
                (A)
                       TYPE:
                (B)
                                      nucleic acid
                       STRANDEDNESS: Single
                (C)
                       TOPOLOGY:
                (D)
                                     linear
               SEQUENCE DESCRIPTION: SEQ ID NO:28:
        (xi)
TCCATTATTA ATTTCGAAAA GTTG 24
       INFORMATION FOR SEQ ID NO:29: (i) SEQUENCE CHARACTERISTICS:
(2)
                      LENGTH:
                                  8
                (A)
                       TYPE: amino strandedness: single
                (B)
                                      amino acid
                (C)
                (D)
                      TOPOLOGY:
                                      linear
               SEQUENCE DESCRIPTION: SEQ ID NO:29:
        (xi)
Ser Ile Ile Asn Phe Glu Lys Leu
                 5
(2)
       INFORMATION FOR SEQ ID NO:30:
               SEQUENCE CHARACTERISTICS:
                      LENGTH:
                                  56
                (A)
                      TYPE:
                                      nucleic acid
               (B)
                       STRANDEDNESS: Single
               (C)
                      TOPOLOGY:
               (D)
                                      linear
               SEQUENCE DESCRIPTION: SEQ ID NO:30:
        (xi)
CAGCTGCAGT CCATTATTAA TTTCGAAAAG TTGTCAGGCA CTCAGCCAAC 50
TGTGGC
(2)
       INFORMATION FOR SEQ ID NO:31:
               SEQUENCE CHARACTERISTICS:
        (i)
                      LENGTH:
               (A)
                                      56
               (B)
                      TYPE:
                                      nucleic acid
                      STRANDEDNESS: Single
               (C)
               (D)
                      TOPOLOGY:
                                      linear
               SEQUENCE DESCRIPTION: SEQ ID NO:31:
CAGCTGCAGT CCGAGAAAAC AGTGGCAGCT GTC
                                                                 33
(2)
       INFORMATION FOR SEQ ID NO:32:
               SEQUENCE CHARACTERISTICS:
                    LENGTH: 22
               (A)
                      TYPE:
               (B)
                                      nucleic acid
                      STRANDEDNESS: Single
               (C)
                      TOPOLOGY:
               (D)
                                      linear
               SEQUENCE DESCRIPTION: SEQ ID NO:32:
AGCTCCATAC ATAGCTGAGA CA 22
(2)
       INFORMATION FOR SEQ ID NO:33:
               SEQUENCE CHARACTERISTICS:
                      LENGTH: 20
               (A)
                      TYPE:
                                      nucleic acid
                      STRANDEDNESS: Single TOPOLOGY: linear
               (C)
                    TOPOLOGY:
                                      linear
       (xi)
               SEQUENCE DESCRIPTION: SEQ ID NO:33:
TGGTTGAACC AAGAGGCGAA 20
```